

CLAIMS

What is claimed is:

1. A method of diagnostic imaging comprising the steps of:
5 determining a position of a subject in a scanning bay relative to a reference position;
automatically adjusting an attenuation characteristic of an attenuation filter based on the determined position of the subject; and
imaging the subject.
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2. The method of claim 1 further comprising determining a size and an elevation of the subject within the scanning bay.
3. The method of claim 2 further comprising adjusting the attenuation
15 characteristic of the attenuation filter according to the size and the elevation of the subject.
4. The method of claim 1 further comprising automatically adjusting the elevation of the subject within the scanning bay to optimize radiation exposure to the
20 subject.
5. The method of claim 1 further comprising acquiring data from at least one scout scan to determine the position of the subject in the scanning bay.
- 25 6. The method of claim 5 further comprising determining at least one of a size, a shape, and a centering of the subject from the at least one scout scan.
7. The method of claim 5 wherein the step of acquiring data from at least one scout scan includes acquiring a flux trend of the scout scan and wherein the step of
30 adjusting an attenuation characteristic of an attenuation filter includes adjusting a filter position according to the flux trend.

8. The method of claim 7 wherein the step of adjusting an attenuation characteristic of an attenuation filter includes at least one of:

- 5 adjusting a position of the attenuation filter to avoid flux rates beyond a threshold rate; and
adjusting a position of the attenuation filter according to a flux rate of a central region of the subject.

9. The method of claim 1 wherein the step of adjusting an attenuation
10 characteristic of an attenuation filter includes configuring an imaging filter to provide an optimal dose profile of high frequency electromagnetic energy to the subject.

10. The method of claim 1 further comprising modulating a high frequency
electromagnetic energy projection source at least according to the position of the subject
15 in the scanning bay.

11. The method of claim 1 further comprising performing at least one
orthogonal scout and performing centroid calculations to determine a center of the
subject.
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12. The method of claim 1 further comprising determining a diameter of the
subject and an optimum bowtie filter opening for the diameter of the subject.

13. The method of claim 1 further comprising determining a contour of the
25 subject and the position of the subject in the scanning bay according to feedback from at least one of a laser sensor and a sonic sensor.

14. The method of claim 13 further comprising determining an area of the
subject from the contour of the subject.
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15. The method of claim 1 further comprising determining a position of the subject in three dimensions.

5 16. A computer readable storage medium having stored thereon a computer program representing a set of instructions which, when executed by at least one processor, cause the at least one processor to:

receive feedback regarding mis-centering of a subject to be scanned;

determine a value of mis-centering of the subject to be scanned;

10 adjust at least one of an attenuation filter configuration and a subject position based on the value of mis-centering; and

acquire radiographic diagnostic data from the subject.

17. The computer readable storage medium of claim 16 wherein the at least
15 one processor is further caused to repeatedly receive position information about the attenuation filter during the acquisition of radiographic diagnostic data from the subject.

18. The computer readable storage medium of claim 16 wherein the at least
one processor is further caused to determine a desired tube current modulation in a first, a
20 second, and a third direction with respect to a desired image noise and dynamically adjust a tube current based on the desired tube current modulation.

19. The computer readable storage medium of claim 16 wherein the at least
one processor is further caused to determine a center of mass of the subject and determine
25 a distance of the center of mass from isocenter.

20. The computer readable storage medium of claim 19 wherein the at least
one processor is further caused to determine a centering error from the distance of the
center of mass of the subject from isocenter.

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21. The computer readable storage medium of claim 19 wherein the at least one processor is further caused to adjust a projection area according to the determined centering error.

5 22. The computer readable storage medium of claim 16 wherein the at least one processor is caused to adjust the position of the subject by adjusting an elevation of the subject.

10 23. The computer readable storage medium of claim 16 the at least one processor is further caused to determine an optimum opening of the attenuation filter to optimize the acquisition of radiographic diagnostic data from the subject while reducing dosage of electromagnetic energy projected toward the subject.

15 24. A tomographic system comprising:
 a rotatable gantry having a bore centrally disposed therein;
 a table movable within the bore and configured to position a subject for tomographic data acquisition within the bore;
 a high frequency electromagnetic energy projection source positioned within the rotatable gantry and configured to project high frequency electromagnetic
20 energy toward the subject;
 a detector array disposed within the rotatable gantry and configured to detect high frequency electromagnetic energy projected by the projection source and impinged by the subject;
 an attenuation filter positioned between the high frequency
25 electromagnetic energy projection source and the subject; and
 a computer programmed to adjust at least one of an attenuation characteristic of the attenuation filter and a table position based on a specific position of the subject in the bore.

30 25. The tomographic system of claim 24 wherein the computer is further programmed to determine a mean high frequency electromagnetic energy at a central

portion of the subject with respect to a desired image noise, and dynamically adjust a tube current to maintain the desired mean high frequency electromagnetic energy at at least one of the central portion of the subject and an edge portion of the subject.

5 26. The tomographic system of claim 24 wherein the computer is further programmed to adjust the attenuation characteristic to reduce noise.

10 27. The tomographic system of claim 24 wherein the attenuation filter is a bowtie filter having multiple filtering elements dynamically positioned within an x-ray path.

 28. The tomographic system of claim 24 wherein the computer is further programmed to perform an imaging scan.

15 29. The tomographic system of claim 28 wherein the computer is further programmed to sense a maximum edge x-ray flux and determine whether the maximum edge x-ray flux is within a selected range.

20 30. The tomographic system of claim 29 wherein the computer is further programmed to adjust the configuration of the attenuation filter to maintain the maximum edge x-ray flux.